Centre for Work Health and Safety

Submission to the SafeWork NSW Independent Review

February 2023

NSW GOVERNMENT

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Introduction

On 5 December 2017, the Centre for Work Health and Safety (Centre for WHS) was established to leverage cutting edge research and data to create awareness, suggest smarter approaches and bring about behaviour change in work health and safety (WHS).

Agile and different in its approach and built on a foundation that education and awareness aren't always enough to drive behaviour change. The Centre for WHS supports SafeWork NSW's (SafeWork) prevention efforts by taking research beyond a contribution to the academic literature, focusing on the translation of research into practice. The Centre for WHS delivers holistic evidence informed initiatives, interventions, practice, guidance and products to the NSW community.

This Centre for WHS has a strong data science capability supporting SafeWork NSW's aim to be an exemplar regulator. Insights and intelligence that identifies emerging trends, informs policy and practice, and enables targeted harm prevention.

Since its establishment, the Centre for WHS has engaged over 10,000 participants in its research, engaged 27 students through the Academic Studies program and achieved a number of world-first solutions for the prevention of harm including:

- a real-time silica dust detector - that will detect harmful levels of silica dust in real time, and alert people to take precautions,
- an artificial intelligence WHS risk scorecard – that guides workers and businesses through the healthy and safe implementation, and use of this new technology in the workplace.
- a best practice guide - to support Supervisors to look after the psychosocial health of people working flexibly, and
- a series of collaborative robot WHS guidelines – that support the consideration and control of WHS at the point of design, integration, use and maintenance of robots.

The Centre for WHS welcomes the opportunity to contribute to this important review.

Centre for Work Health and Safety's role

The Centre for WHS is part of SafeWork NSW. It undertakes research and development supporting the functions and powers of the regulator in line with the Work Health and Safety Act 2011.

Functions of the regulator (under section 152 of the WHS Act):

> (b) to **monitor** and enforce compliance with this Act,

> (c) to **provide advice and information** on work health and safety to duty holders under this Act and to the community,

> (d) to **collect, analyse and publish statistics** relating to work health and safety,

> (f) to **promote and support education** and training on matters relating to work health and safety,

Powers of the regulator (under section 153(1) of the WHS Act):

> SafeWork NSW also has power, subject to the WHS Act, to do **all things necessary or convenient to be done for or in connection with the performance of its functions** (section 153(1) of the WHS Act).

Governance

The Centre for WHS is supported by the Research Foundation (Foundation), a multidisciplinary committee comprising of leading academics and researchers in work health and safety, as well as leaders in business and government.

The Foundation works closely with the Centre for WHS to create research that is industry driven, credible, ethical, collaborative, methodologically robust, and peer reviewed. This leads to the improved translation of research, data and evaluation into regulator decisions and community/workplace practice.

The Centre for WHS's research is performed in line with comprehensive research and project governance frameworks and is subject to an evaluation process. This is overseen by the Research and Evaluation Governance Group (REGG). The REGG provides advice and make decisions relating to the suitability and priority of new project proposals, resource allocation, project variations, budget, risks and issues, and anything else that may affect the scope or performance of projects undertaken.

The Head of SafeWork NSW is the delegate for the approval of new projects.

Our approach

The Centre for WHS is a world-class collaborative research body driving smarter approaches to the way we think and act about work health and safety (WHS). With a diverse team who foster a culture of collaboration, trust and respect, its partnerships with industry, academia and with private innovators is leading WHS research and development.

The approach enables research to be conducted using in-house researchers or engaging partners with difference skills in desired disciplines. This means it can manage a greater number of research projects simultaneously whilst ensuring the quality of the work by choosing the best partner for the job.

The Centre for WHS is currently working with over 12 universities across a portfolio of 30 projects.

For more information on the Centre for WHS approach, please refer to Tab A – Research Blueprint.

Discovery

All innovation starts out life as an idea. Many ideas come to us directly from regulators, workers, industry and academia. Other ideas are sparked by the intelligence gathered through WHS RADAR about emerging trends, leading indicators, new technologies and the changing world of work.

All research ideas undergo a high level of scrutiny to consider the opportunity, value, originality, potential impact on positive WHS outcomes to inform the decision of acceptance and scope of potential projects.

Research and development innovators are chosen to work with us on an idea through competitive international tenders, investment partnerships, and opportunity driven engagements.

Research & development

The Centre for WHS is not just a funding partner, we embed our experts into research and development teams and work alongside partners on all projects.

Ideas often don't come to the Centre for WHS fully formed. Operating from the belief that collaboration is key to understanding the whole issue and creating break-through success. Bringing divergent thought and expertise to identify, pose and tackle important questions that emerge. A co-design approach advances these ideas into fully-fledged research and development opportunities. This approach is maintained throughout the project, considering emerging insights along the way and working in partnership to design a contemporary solution that is fit for purpose.

Not all solutions require a traditional research approach. The Centre for WHS's adopts a diverse range of methodologies, whilst maintaining quality, ethics and rigour, enabling quick results but also drives innovation. Priding itself on being adaptive, having a timely attitude, knowing when to be proactive and knowing when to be reactive.

Delivery

The Centre for WHS ensures its research generates and/or distributes new knowledge about work health and safety risks and controls, and that these outputs are practical and useful for the end user.

By using a human-centred approach, evidence-based solutions are developed with the real-world application in mind. Boasting in-house expertise in behavioural insights, research is enriched with a cultural and behavioural focus.

The Centre for WHS uses science outreach methods to raise interest, awareness and reach the target community for a positive WHS impact.

All products and services are made available on the Centre for WHS website.

Culture and employee engagement

What differentiates the Centre for WHS from anything else is its people. It is made up of a diverse and eclectic mix, who built a culture of innovation, support and a willingness to try. The team believes in the power of the collective and that diverse perspectives create innovation and better outcomes.

The members of this small divergent team boasting qualifications in over 20 academic disciplines and hailing from 5 continents with experience across many types of business, challenges each other to think outside of the box and to challenge the status quo. This is crucial to the Centre for WHS's success and is reflected in its supportive culture.

Supporting a modern regulator

SafeWork NSW (SafeWork) is committed to being an exemplar WHS regulator influencing community practice and securing safety standards that lead to a reduction in work related fatalities and serious injuries and illnesses.

The Centre for WHS generates new intelligence, understanding and practical solutions placing these in the hands of workers, employers, policymakers and the regulator to raise awareness, education, drive behaviour change and secure safety standards.

The composition of a research body alongside a regulator differentiates both functions from its counterparts. A mutually beneficial system, the research and development operation draw on WHS regulatory knowledge and experience and works closely with inspectors and technical experts who are responding to and investigating harm in the field. It leverages SafeWork's partnerships to support research design through to delivery, resulting in holistic insights and real solution for the NSW community.

The Centre for WHS research insights, and data science function provides intelligence, insights, and tools to inform SafeWork's strategy and regulatory practice. Its surveillance function identifies emerging WHS issues that are new or likely to be increasingly relevant, that are affecting a growing proportion of the workforce and new technology or solutions that may aid a reduction in harm.

Focus areas

The Centre for WHS has three focus areas.

- Harm prevention: Studying the future work environment from the perspective of WHS to keep up with evolving technology, changing practices and to ensure regulators are prepared for the future. Investigating ongoing and re-emerging risks to understand the motivations of why workers and businesses undertake unsafe practices when risks are well known and seeking out new solutions.
- Better regulation: Leading WHS through a novel application of the regulatory framework and delivery of its functions, strengthening the regulator's detection and response capability to non-compliance; increasing voluntary compliance; and driving efficiencies to direct efforts to the areas of greatest need.
- WHS leadership; Supporting collaboration and participation WHS research in Australia to support new participation in tertiary WHS education, and standards for the WHS community.

These are expanded on below.

Harm prevention

The Centre for WHS's has invested in a number of streams of research to aid the prevention of harm, studying the future work environment, and investigating ongoing and re-emerging risks. Its approach to these challenges is varied with some novel examples below.

Future of work

Understanding the new world of work is integral to the prevention of harm. As new technology, ways of working, and types of work are deployed, WHS risks are often unknown although crucial to ensuring businesses and WHS regulators are prepared for the future.

The Centre for WHS has conducted a number of projects generating new knowledge and insights, and solutions including a number of world firsts.

In 2020, a competitive open tender seeking creative research proposals to aid the prevention of workplace harm in the future work of work resulted in partnership on four research projects, all now concluded.

1. Preventing psychological harm in the first responder organisations
2. Trusting artificial intelligence at work
3. Flexible work and psychosocial safety
4. Ethical use of artificial intelligence in the workplace

Other projects include *Safe Collaborative Robot Design and Implementation* generating a set of guides to assist businesses who are using or will use collaborative robots (cobots) develop an effective WHS framework for cobot-specific hazards. Research into harms specific to older workers has created the *Healthy Older Worker toolkit* to support positive WHS and enable longevity in workforce participation. Its research to understand the challenges of food delivery riders was vital to SafeWork's Food Delivery Rider Safety Taskforce, and its efforts to change the industries approach to WHS.

The Centre for WHS is researching the future work environment from the perspective of the WHS regulator to better understand and plan for effective regulation of workplaces in the future. This includes identifying options for effectively regulating the future state and developing capability, technology, and process to enable a regulator that is ready and flexible enough to support a continuously changing work environment.

The Centre for WHS maintains surveillance of these trends and continues to initiate research to better understand and provide solution to new WHS challenges.

Ongoing and re-emerging harms

The Centre for WHS conducts research to identify new insights, and new methods to aid harm prevention when risks are well known.

Resulting in the development of tools and resources, this stream of work is crucial to prevention of harm. The Centre for WHS's research has created real impact, for example;

Following research conducted with small business, the Easy to Do WHS toolkit was created. A practical tool designed to help small businesses to interpret the WHS legislation and apply it appropriately. This resource has 15000 hard copies in circulation, 17000 page views on the website, including pdf downloads and the digital tool has received over 190,000 page visits.

Refer to *Tab B - Overview of projects* to see more examples.

Public/private partnerships

The prevalence of workplace risk has attracted many amateur entrepreneurs with great ideas or solutions that haven't found their way to commercial success. Often this isn't because the solution is inept, but rather its journey to success.

The Centre for WHS acknowledges this opportunity and has engaged in a number of these ventures.

World-First Real-Time Silica Dust Detector

Increasing harm caused by exposure to respirable crystalline silica (RCS) led the Centre for WHS to establish a project to understanding the problem, available solutions and emerging research. The Centre for WHS then conducted a worldwide open tender to find a better solution. Trolex submitted the winning tender.

Forming a partnership with Trolex in 2020, the world-first technology to monitor silica dust in real-time has been developed. In laboratory and field testing, this prototype accurately detected silica from quarried and crushed rock, as well as milled and processed artificial stone. The Trolex Air XS has passed its rigorous independent testing program and is now available for purchase.

NSW has invested over $1M in this world first technology which will be returned to the NSW community through a rebate system. NSW businesses are eligible for a $1000 rebate on the purchase of each detector for their business.

This device has been developed through NSW investment, and will ultimately prevent harm to NSW workers.

Research and Development (R&D) EOI

Following the success of the World-First Real-Time Silica Dust Detector, the Centre for WHS launched a program seeking expressions from innovators to work with the team to advance tangible solutions that can prevent harm in the workplace. By assisting in that important transition to the market, this work will advance evidence-based products or services that better WHS outcomes.

The EOI process has led to the establishment of 2 projects which are ongoing.

- WHS Translation Tool; Over 31% of the NSW workforce was born overseas. This tool enables safety information to be translated to workers in their native language to ensure that messaging is understood. The app also has functionality to enable visual communication and supervisor check-ins to endorse safe work practices before they proceed.

- Wellbeing AI Application Using Linguistic Analysis; While we may not realise it, when we are unwell, unhappy or tired, the types of words we use, the word lengths and our sentence constructs change. Using linguistic analysis and behavioural insights, this app monitors a worker's electronic activity and provides proactive 'nudges' to interrupt these negative patterns. Team and company reports are also produced to help businesses provide proactive solutions to prevent burnout, and meet the mental health needs of their workers.

For more information on the Centre for WHS projects, please refer to Tab B - Overview of projects.

Better regulation

The Centre for WHS conducts research to support SafeWork's regulatory priorities, practice and policy. This includes forward-looking research to understand the changing world of work and the likely implications for WHS in the workplace and the wider community to ensure that SafeWork remains a modern, enabling regulator that is prepared with a regulatory framework that is fit for the future.

Data science

The Centre for WHS's surveillance function supports SafeWork's evidence-based practice. An example of this effort is demonstrated through the WHS rating project.

WHS rating

The research team conducted analysis of various data sets including business demographics, WHS compliance history, workers compensation claims performance and other information sources. Using predictive analytics, this data was considered and tested to identify the predictive power of more than 400 characteristics in determining the risk of a business having an incident in the next 12 months.

This resulted in the creation of tool, underpinned by state-of-the-art machine learning techniques, that generates a rating for NSW businesses as a function of their risk of non-compliance to WHS legislation.

The WHS Rating is embedded in SafeWork NSW's operational decision making and processes and enables a more effective allocation of resources towards workplaces the most at risk to harm workers.

Regulatory practice

Work Health and Safety (WHS) laws specify the orders that courts may impose on WHS offenders as part of sentencing. In addition to fines, these include adverse publicity orders, restoration orders, WHS project orders, training orders and release upon the giving of a WHS undertaking. The use of such orders increases awareness, builds skills, and repairs harm however had only been used once in WHS sentencing in Australia.

The Centre for WHS conducted research into the impact of non-monetary court orders and the principles for when to raise the possibility of a particular order to the court. This resulted in the creation of a guide for regulators being which summarises evidence of how non-monetary orders have been applied across Australian jurisdictions to help inform WHS regulators wanting to make sentencing submissions to courts.

Since its release, 12 alternative orders have been included in SafeWork NSW's matters upon sentencing.

For more information on the Centre for WHS projects, please refer to Tab B - Overview of projects.

WHS Leadership

In academia, work health and safety research is not recognised as a specific field of study. Instead, you have psychologists, ergonomics, epidemiologists, physiotherapists, and other specialities contributing to the field of knowledge and tools. As a result, collaboration is limited and the contribution to WHS research in Australia is declining.

Standards for WHS professionals are lacking with low participation in tertiary WHS education, as this is not considered a valuable requirement to enter the workplace. These two dynamics influence each other noting that an increase in research, and participation in tertiary education will lead to better WHS outcomes.

The Centre for WHS has formed enduring connections with the research community and is seen as the leader in this space. It leads a number of initiatives to support this community.

WHS Radar

The Centre for WHS created the National WHS Radar, an initiative to deliver the latest insights on work health and safety in Australian workplaces twice a year.

The National WHS Radar empowers Australian regulators, academics, and leaders to take a proactive approach to WHS, informing existing and future policies, practices, and research projects.

Every six months, the Centre for WHS's Research Team will delve into a range of new WHS data and evidence incorporating data from five streams:

- existing data, including incidents, worker's compensation, ABS, and prosecutions
- analysis of grey literature
- social media listening
- nationwide survey of WHS inspectors and experts
- nationwide survey of Australian workers across all industries

This information will be synthesised and analysed to create a National WHS Radar Report delivering relevant, local, and current information to people who can effect real change, and ultimately create safer workplaces in Australia.

Supported by the Heads of Workplace Safety Authorities (HWSA), this type of reporting has never been done at this scale and frequency in Australia.

The first report is due for release 6 April 2023 and will be made publicly available on the website.

Academic studies program

The Academic Studies program offers internships and work placements to WHS research students directing their efforts to mutually beneficial work and further contribution to research in areas of value.

The Centre for WHS manages the postgraduate and graduate students and other university internships in-house, provides;

- Students with real experience connecting them to the industry they are researching.
- Encourages greater university participation in WHS fields.
- Increases research into WHS fields in Australia.
- Increases the standards for WHS professionals.

Since its commencement in 2021 the program has managed 27 students.

Annual WHS colloquium

The National Work Health and Safety Colloquium is an annual gathering of researchers, innovators and leaders discussing current and emerging projects and concepts WHS. This is an annual event lead by the Centre for WHS encourages collaboration and support new entrants to the WHS research fields.

23rd World Congress on Safety and Health at Work

The World Congress is a global forum for advancing worker health protection. Established by the International Labour Organization (ILO) and the International Social Security Association (ISSA), it brings together health and safety leaders and experts from around the globe to share experiences and information on contemporary issues facing occupational safety and health, with the aim of promoting prevention worldwide. It is the 'Olympics' of work health and safety'.

In 2023, SafeWork NSW is the host and co-organiser of the event. Over 5 days, health and safety leaders and experts from around the globe will come together to share experiences and information on contemporary issues facing WHS, with the aim of promoting prevention worldwide.

The World Congress will be held at the International Convention Centre, Sydney, the first time in Australia, and provides the opportunity showcase leadership in WHS to an international audience.

Expecting over 2000 delegates from 120 countries, delegates will have the opportunity to join a wide variety of workshops, interactive discussions, symposia, and technical sessions, and listen to keynote speakers. There will also be an opportunity to tour some of Australia's leading businesses and see their work health and safety practices in action.

Conclusion

The Centre for WHS welcomes the opportunity to make this submission to the independent review of SafeWork NSW. Today, the Centre is engaged in over 30 ground-breaking work research projects across 3 key areas; improving regulatory practices, anticipating new and emerging ways of working, and continuing to address traditional harms.

The Centre for WHS will continue to support SafeWork's NSW in the delivery of its function to aid the prevention of harm and better regulation.

Tab A – Centre for WHS Research Blueprint

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Centre for Work
Health and Safety

Research and Development Blueprint

Who we are

We are critical and creative multidisciplinary thinkers who action real change in work health and safety.

We are leaders in work health and safety research and development.

The Centre for Work Health and Safety is a world-class collaborative research body that drives a smarter approach to the way we think and act about work health and safety (WHS).

We are a part of the NSW Government, giving us unique access to data and policy influencers to ensuring our research turns into tangible outcomes.

Our diverse team allows us to challenge traditional methods, and foster a culture of collaboration, trust and respect.

Applying research to practical safety solutions.

We champion collaborative work health and safety research and development partnerships with global industry, academic and private innovators.

We enable access to funding to ensure research and development insights are turned into tangible outcomes, and shared for maximum impact.

We work with...	Our expertise...	Our work is...
• Leading academics	• Policy	• Industry driven
• Industry innovators	• Business	• Credible
• Workers	• Outreach	• Ethical
• Government	• Data science	• Collaborative
• NGOs	• Research	• Methodologically robust
• Regulators	• Development	• Outcome focused
• WHS Professionals	• Education	
• Students and early career researchers	• Innovation	
	• Behavioural insights	
	• Regulation	

What we do

Research and development

Collaborating for a better future	Proactively safeguarding health and safety for all	
An all in approach to WHS	**A changing world of work**	**Futureproofing against ongoing and re-emerging risks**
For example: Leading from the top, performance measures, governance (ESG), quality of work, organisation of work, safety culture, regulation and enforcement, prevention, application of WHS regulation.	For example: Future of work, technology driven change, sharing economy, gig economy, flexible / new ways of working, human-centred design and behavioural insights, mental health, fragmentation / casualisation of work, whole-worker health, psychosocial factors at work, new work.	For example: Supply chain, safety in design, workplace health and public health, ageing workforce, managing change in declining industries, experience of First Peoples, education and global skills training, biological hazards, occupational disease.

At-risk workers

High-risk industries / harms

Organisation of work

Developing future leaders

We invest in the future of WHS.

- We encourage new people to enter research through our academic studies program; where undergraduate, Honours, Masters and PhD students are invited to participate in research and development.

- We bring together current and future WHS leaders and experts from around the globe to share experiences and information on contemporary issues facing WHS, with the aim of promoting prevention worldwide, and enabling connections between industry and academic innovators.

- We advance tangible solutions that can prevent harm in the workplace, creating evidence-based marketable products or services.

- We have many ways in which we can redirect our investment back into the community we serve, for example, in the case of our real-time RCS detector, the entirety of our financial support was passed on to the consumer in the form of rebates when purchasing the technology.

How we do it

This collaborative approach allows us to respond in real-time to emerging government, industry, and community needs.

"WHS RADAR highlights the current state of play with regard to WHS in and outside of Australia, as well as point to potential WHS issues in the future world of work."

Discovery

- All innovation starts out life as an idea.

- Many ideas come to us directly from regulators, workers, industry and academia. Other ideas are sparked by the intelligence that we gather through WHS RADAR about emerging trends, leading indicators, new technologies and the changing world of work.

- We prioritise ideas in line with the needs of the community.

- We choose research and development innovators to work with us on an idea through competitive international tenders, investment partnerships, and opportunity-driven engagements.

Co-design

- Ideas often don't come to the Centre fully formed. When we want to know more about an idea, we open up the conversation to a broader audience.

- We operate from a belief that collaboration is key to understanding the whole issue and creates break-through success. We bring divergent thought and expertise to identify, pose and tackle important questions that emerge.

- This co-design approach advances these ideas into fully-fledged research and development opportunities.

Research & Development

- Not all solutions require a traditional research approach. We underpin our process with a diverse range of methodologies to drive contemporary outcomes.

- Not just a funding partner, we embed our experts into the research and development teams.

- We work closely with partners to respond to insights as they emerge.

The result

Delivery

- Our work makes a difference to work health and safety challenges in the workplace.
- By using a human-centred approach, our evidence-based solutions are developed with real-world application in mind.
- We are in a unique position to ensure our research insights are turned into practical and accessible interventions, created with the end user in mind for maximum uptake.

Impact

- Ensuring the research is practical and useful for the end user
- Generating and/or distributing new knowledge about work health and safety risks and controls
- Quickly translating research findings and new knowledge into practice and innovative harm-prevention interventions
- Return on investment

Our solutions range from...

- New information
- Tools
- Technologies
- Change of work practices
- Education and engagement
- New opportunities
- Better regulation
- Policy influence
- Preparing for the future
- Behaviour change
- Enabling business

Engage with us

Stay up-to-date with the Centre's research, apply for a research partnership or pitch your research idea to us.

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Tab B – Overview of projects

Easy to do WHS Tool kit

In many cases, small businesses do not have a dedicated WHS professional in the workplace. In addition, small businesses are often family businesses, with a mix of part-time and casual workers.

To support over 900,000 small businesses in NSW, an 'Easy to do WHS' toolkit was created in response to the needs of small business who were asking for clarity and guidance on their compliance obligations.

The Centre for Work Health and Safety conducted research that included front end feedback and behavioural insights to help shape the toolkit and conducted a three-phase research project to refine and evaluate the efficacy of this resource which included testing the toolkit with the Childcare industry (n=52).

The *Easy to do Work Health and Safety toolkit* explains the seven components of work health and safety to help you create a safer, healthier and more successful business. This is intended to provide guidance to small business who aren't sure where to start.

Since its release:

15000 hard copies are in circulation – with toolkits being taken to many industry events.

17000 page views on the website, including pdf downloads

The digital tool launched in May 2019 with over 190,000 page visits in the first two years.

You can access the toolkit:

https://www.safework.nsw.gov.au/easywhs-beta

For the supporting research:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/small-business-initiative-easy-to-do-toolkit-report

A Best Practice Guide for flexible and work-from-home arrangements

Flexible work is becoming more common, and the demographic of the Australian workforce is shifting (e.g. ageing population, increase of women participation in management roles, increase of males undertaking caring roles, increased participation of workers with a disability, and global mobility reshaping the profile of organisations).

More businesses are providing flexible work arrangements leading to a pressing need for a new and more inclusive WHS framework. Workers are under a combined influence of individual psychological factors and the surrounding social environment on their wellbeing and ability to function.

This guide provides practical strategies and resources that organisations can adopt to enhance the wellbeing of flexible workers.

Based on survey responses (n=1039) and in-depth interviews with managers of flexibly working employees (n=52), this guide focuses on key elements of psychologically safe and productive environment. It was developed through a framework of evidence created collaboratively by the Centre for Work Health and Safety, Edith Cowan University, Southern Cross University, The University of New South Wales, and Live Better.

Since its release:

2000 hard copies are in circulation – with toolkits being taken to many industry events.

1761 page views on the website, including pdf downloads

The toolkit was presented by our lead researcher at the National Mental Health Conference.

Over 7000 impressions on social media with 489 active engagements with the content

Research published in the Journal of Applied Ergonomics

You can access the toolkit:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0004/1011919/A-Best-Practice-Guide-_Final.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/flexible-working-and-psychosocial-safety-summary-report

AI WHS Scorecard

Artificial Intelligence (AI) is fundamentally changing jobs across different industries and types of work. These developments have given rise to a new type of machine, a prediction machine, which can automate complex decision-making tasks. This technology provides many benefits, such as increasing productivity, streamlining processes and lowering the cost of making accurate predictions.

However, many businesses who are introducing this technology do not have a sufficient understanding of the limitations of these prediction machines. The introduction of AI can have unintended consequences on a worker's wellbeing, outside of what could traditionally be recognised as a harm. Attention needs to be paid to the appropriate safe and ethical handling of AI technology.

This scorecard, that began through our *Changing World of Work EOI,* provides businesses and regulators with a way to identify new WHS risks associated with the planning, implementation and ongoing use of AI technologies in the workplace.

Based on existing literature, industry interviews (n=42) and workshops (n=22) and feedback from WHS inspectors (n=15), the scorecard is consistent with the Australian Government endorsed AI Ethics Principles, and Safe Work Australia standards for managing workplace health and safety hazards.

Since its release:

1628 page views on the website, including pdf downloads

The toolkit was presented by our research partner at the 2021 National WHS Colloquium, and by our lead researcher at the 2022 AIHS National Health and Safety Conference

Over 2500 impressions on social media with 153 active engagements with the content

Research published in the AI & Society – Journal of Knowledge, Culture and Communication

You can access the toolkit:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0020/1013825/AI-WHS-Scorecard.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/ethical-use-of-artificial-intelligence-in-the-workplace-final-report

***In development - AI WHS Scorecard 2.0** - through industry consultation, the scorecard is being updated to also provide risk management/mitigation strategies for the identified risks. The update will also include the digitisation of the scorecard.

Crane safety incident causation model

NSW has one of the highest numbers of active cranes of anywhere in the world, with Sydney having the second highest number of cranes behind Dubai. With this amount of high-risk plant in operation, incidents continue to occur.

As the Centre's flagship project, this research investigated the causes of fixed and mobile crane related incidents and the approaches that have been successfully implemented to prevent them in the construction industry.

The crane causation model identifies causes and contributing factors associated with safety incidents involving cranes in the construction industry, allowing for more proactive planning of safe crane operations.

The guide was developed through evidence-based research and feedback from industry experts and workers (n=35), in partnership with RMIT.

Since its release:

4465 page views on the website, including pdf downloads

Over 2600 impressions on social media with 142 active engagements with the content

Research published in Safety Science

You can download the guide:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0006/875391/Crane-incident-causation-model.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/crane-safety

How-to Guide - Food Delivery Safety Messaging

The gig economy has seen a rapid growth in the last few years, doubling in size between 2014–2016 (SIRA, 2019) with independent contractors comprising 8.2% of the Australian workforce (ABS, 2018).

Technological advancement and the emergence of app-based business structures have created flexible working opportunities for workers across a range of expanding sectors. These changes have also provided better access, flexibility and prices for customers and consumers.

However, despite such advancements, the gig economy has generated confusion around worker rights, legal roles and responsibilities.

This research spoke with food delivery workers (n=167), platforms and associated industries (n=11) to better understand the challenges facing workers. Researchers also observed behaviour at 16 locations across Sydney and undertook a service safari where they signed up to a platform and conducted deliveries to understand pressures of this work.

From the research, a bespoke messaging campaign was designed and trialled with food delivery workers (n=14281).

This research, conducted with Behavioural Insights Team Australia, developed a resource for food delivery platforms to design and implement behavioural messaging campaigns that aim to improve the WHS of food delivery workers in the gig economy.

The guide assists in diagnosing challenges, planning of behavioural strategies, implementation, and evaluation of the campaigns.

Since its release:

6524 page views on the website, including pdf downloads

The guide was presented to over 50 safety professionals at our Look East Webinar

Over 10700 impressions on social media with 354 active engagements with the content

You can download the guide:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0016/1004281/How-to-Guide-Food-Delivery-Safety-Messaging.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/gig-economy-roles-and-responsibilities-in-whs

This research, and the Centre for WHS's role was also pertinent to advancing the work of the Food Delivery Rider Safety Taskforce, specifically managing the development of the guide to managing WHS in the food delivery industry, and the negotiations and delivery of the industry action plan.

For the work of the Joint Taskforce:

https://www.safework.nsw.gov.au/your-industry/transport,-postal-and-warehousing/food-delivery-industry

Safety Climate Scales

Traumatic injury resulting from poorly guarded machines was a priority area in the Work Health and Safety Roadmap for NSW 2022 (SafeWork NSW, 2016). Past research has demonstrated that leadership, safety culture and the way training is implemented, followed up and incorporated into the organisation by managers is important to improve front-line machine safety behaviours.

This project explored the culture for safety in metal and wood manufacturers (n=70) through questioning their day-to-day operations and organisational procedures. This identified that measurement of safety culture (via the industry-specific diagnostic survey), combined with conversations with workers and managers is an effective way to identify areas of improvement and to get added detail around the nature of safety, leadership and work practices in the organisation.

These tools, developed in partnership with Griffith University, help to evaluate Safety Climate – a leading safety indicator that considers the mood of a worksite toward safety, whether it is valued and prioritised.

The scales address unique indicators of safety prioritisation for different industries that include:

Agriculture, forestry and fishing: Mixed livestock farming

Construction: Residential construction

Health care and social assistance: Disability support

Manufacturing: Meat processing

Public administration and safety: Security

Transport: Long distance road freight

Since its release:

1121 page views on the website, including pdf downloads

Research published in the Journal of Safety Research

You can view the scales:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/safety-climate-scales

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/industry-specific-safety-climate-tool

Guidelines for the integration of WHS management in BIM

The current approach to managing work health and safety on major construction projects is using a WHS Management System. However, technological improvements have seen the rise of "digital engineering" and the use of Building Information Modelling (BIM) to facilitate project design, planning and management.

The research included semi-structured interviews (n=9), international case study interviews (n=14).

This set of guidelines, created in partnership with Torrens University and Western Sydney University, aids construction companies who are using BIM technologies in identifying and managing WHS hazards early in the process.

The guidelines offer practical advice on how to design and implement effective WHS frameworks while using BIM, including:

1A - Guide to Developing Information Requirements

1B - Best Practice Matrix

2A - Guidelines to Procurement, Tendering and Supply Chain Monitoring

2B - Guide to Completing Project Information Requirement Template

Since its release:

3290 page views on the website, including pdf downloads

The guide was presented by at an industry breakfast which saw major construction companies attend as well as government agencies involved in infrastructure procurement.

Over 1100 impressions on social media with 31 active engagements with the content

2000 hard copies are in circulation – with guides being taken to many industry events.

Research published as a book chapter in Driving Transformational Change in the Digital Built Environment.

Our lead researcher was invited to become a member on both the Australian Standards BIM for WHS management committee to draft the standard, and the International Standard Organisation Working Party to represent Australia. This continues today and the findings from the research are being integrated into these standards.

You can access the guidelines:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/guidelines-for-the-integration-of-whs-management-in-bim

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/building-information-modelling-for-whs-management

Guidelines for the Safe Collaborative Robot Design and Implementation

A new generation of autonomous, collaborative robots (or cobots) designed to work alongside humans is rising in Australian workplaces.

Work health and safety (WHS) risks resulting from the interaction between workers and collaborative robots are not well understood.

This research involved literature reviews, design led workshops (n=9), citizen science (n=20) and guideline evaluation with industry (n=49).

This set of guidelines, built in partnership with University of Technology Sydney, Kairos Now and Centre for Advanced Manufacturing, assists businesses who are using or will use collaborative robots (cobots) in their standard business practices to develop an effective WHS framework for cobot-specific hazards.

The guidelines provide users with the safety aspects of human-cobot collaboration, planning approaches to implementing safe cobot practices, and WHS assessment tools for existing cobot practices.

Since its release:

1290 page views on the website, including pdf downloads

The guide was presented by our lead researcher at the 2022 Asia Pacific Occupational Safety and Health Organization Forum

Over 7700 impressions on social media with 402 active engagements with the content

Research submitted at Australian Conference on Robotics and Automation conference paper.

You can access the guidelines:

https://www.centreforwhs.nsw.gov.au/knowledge-hub/guidelines-for-safe-collaborative-robot-design-and-implementation

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/working-safely-with-collaborative-robots

Mentally Healthy Workplaces – Psychosocial Hazard Work Re-Design Tool (PHReD-T)

In the workplace, poor mental health is emerging as a significant risk to people, businesses, government and the broader community. As awareness has grown, so has the understanding of the associated social, financial, and economic costs of poor mental health in the workplace.

Globally, there is a shift from targeting specific individual risks to a worker's mental health towards a broader approach that identifies and drives key aspects of a mentally healthy workplace.

This research examined ways to improve mental health outcomes at work by providing businesses with the tools and capabilities required to create safe, healthy and productive workplaces through interviews with HR leaders (n=34).

This online tool, built in partnership with UNSW, University of Wollongong is designed to help participants develop skills, competency, and confidence in work-redesign that will prevent and manage psychosocial risks.

The evidence behind the tool was developed as part of the NSW Mentally Healthy Workplaces Strategy, and is funded by SafeWork NSW.

Since its release:

1984 page views on the website, including pdf downloads

The guide was presented at the 2022 National WHS Colloquium

Over 3760 impressions on social media with 280 active engagements with the content

You can access the tool:

https://www.workdesignformentalhealth.org/

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/mentally-healthy-workplaces

Workplace stressors and physical injury cross-sectional

Musculoskeletal disorders (MSDs) are one of the most common work-related harms in that can have long-term, costly impacts for businesses and workers. In NSW, workers who acquire an MSD need on average 17 weeks off work (time lost). The average cost of an injury claim is $32,774.

Research shows that there are physical, psychosocial and organisational causal factors in the workplace that may drive the presence and severity of risk factors for a hazardous manual task. While information on injury prevention exists, workers and businesses are still unsure of how to apply this information in different work situations. This is a challenge for WHS experts and regulators in starting, promoting and using best practice injury prevention.

The research examined what was already known (literature review), identified tools and materials for prevention of MSDs (n=548) and studied research participants to assess incidences of workplace behaviours that may lead to a workplace injury (n=628).

This project, in partnership with University of Newcastle, University of South Australia and Latrobe University, offers businesses evidence linking workplace stressors and physical injury / musculoskeletal disorders (MSDs), along with tools and implementation advice to prevent MSDs in the workplace.

Since its release:

2009 page views on the website, including pdf downloads

These tools were presented as part of the Australian Institute of Health and Safety Webinar series

Over 9700 impressions on social media with 199 active engagements with the content

Research published in the Applied Ergonomics Journal

You can access the summary:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0011/1029287/Summary-report-The-link-between-workplace-stressors-and-physical-injury.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/the-link-between-workplace-stressors-and-physical-injury

Responsive sentencing: Non-monetary orders in WHS

The Work Health and Safety (WHS) laws specify the orders that courts may impose on WHS offenders as part of sentencing.

In addition to fines, these include: adverse publicity orders, restoration orders, WHS project orders, training orders and release upon the giving of a WHS undertaking. The use of such orders increases awareness, builds skills, and repairs harm however these have been used infrequently in WHS sentencing.

In early 2019, an adverse publicity order was handed down for the first time in New South Wales under the harmonised WHS Act. This raised questions regarding the impact of non-monetary court orders and the principles for when to raise the possibility of a particular order to the court.

This guide, developed by the Centre, summarises evidence of how non-monetary orders have been applied across Australian jurisdictions to help inform WHS regulators wanting to make sentencing submissions to courts.

Since its release:

12 alternative orders have been included in SafeWork NSW's matters upon sentencing.

965 page views on the website, including PDF downloads

Over 14000 impressions on social media with 973 active engagements with the content

Research published in the Australia Journal of Labour Law

You can access the guide:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0008/846593/CWHS_RP_040-Guide-for-Regulators.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/responsive-sentencing

Trolex Air XS

Respirable crystalline silica (RCS) consists of silica dust particles that are small enough to penetrate deep into the lung and is known to cause severe health conditions; putting at risk the lives and livelihood of those who are exposed to it.

Workers inhaling RCS are at risk of developing serious, sometimes fatal illnesses such as silicosis and lung cancer. It has also been linked to other illnesses including kidney disease, autoimmune disorders, and an increased risk of tuberculosis.

During the reporting period between 2021-2022, the Dust Disease Register reported 18 cases and 4 deaths due to silicosis in NSW alone.

This research, in partnership with Trolex, developed a world-first. The Air XS Silica Monitor is a detector that monitors RCS in the air in real-time. The device has been tested in laboratories and in the field (n=30).

This ground-breaking device informs and alerts workers of dangerous RCS concentrations to help them change work practices and protect themselves from harm.

Since its release:

5353 page views on the website

The device has been shown and demonstrated at 10 conferences and events in 2022

Over 14000 impressions on social media with 973 active engagements with the content

70 units have been sold in Australia with another 100 on order.

Has won five major international awards across US, UK and Australia.

For information about the device:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0011/1069652/Air_XS_Product_Brochure-Final.pdf

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/silica-detection

Healthy Older Worker Toolkit

In 2017, 15% of the Australian population were aged over 65 (n≈3.8 million), a proportion expected to increase to 20% by 2037. The ageing population has been accompanied by a larger participation of older Australians in the workforce.

This research was undertaken to provide greater understanding of how to prevent psychological and physical harm among older workers.

The Healthy Older Worker Toolkit, designed in partnership with Edith Cowan University and University of NSW, facilitates the identification and assessment of the impact of an ageing workforce on WHS systems. It then provides businesses a step-by-step tool in redesigning work to support older workers in the workplace.

Since its release:

907 page views on the website including PDF downloads

The toolkit was promoted at the 14th World Conference on Injury Prevention and Safety Promotion.

Over 4900 impressions on social media with 275 active engagements with the content

You can access the toolkit:

https://www.centreforwhs.nsw.gov.au/__data/assets/pdf_file/0016/1114252/Centre-for-Work-Health-and-Safety-HOW-Toolkit-Case-Study.pdf

For the supporting research summary:

https://www.centreforwhs.nsw.gov.au/Projects/the-healthy-older-worker-toolkit

Coming Soon

Emerging work health and safety impacts on farmers

Considering the changing nature of work and the mental health implications of an increasingly variable climate, farmers are facing a complex set of challenges to reduce these climatic impacts, as they shift to more sustainable land management practices.

These changes in land management (eg. Grain to solar) can introduce new work health and safety risks which may not be considered during the transition.

This awareness pack, developed with University of Technology Sydney, is designed to support agricultural support services (agribusiness, insurance, plant distributors, etc) to have conversations with the farming community when they are investing in new ways of working (new types of farming, new plant, alternate land use).

The pack puts WHS in the front of mind when making decisions on the future of their farm.

For the supporting research:

https://www.centreforwhs.nsw.gov.au/Projects/emerging-work-health-and-safety-impacts-on-farmers

National WHS Radar

There is an abundance of WHS / OHS data globally available to help inform researchers and policy makers. However, when this is considered from an Australian context, majority of the data is dispersed and too universal to make decisions locally.

The National WHS Radar is an initiative by the Centre for Work Health and Safety to glean WHS information about Australian workplaces from multiple data sources on a recurring six-monthly basis. This is being actioned to serve the WHS research community, governments, and businesses, with insights into challenges, trends, and solutions that are relevant, local, and current.

The National WHS Radar identifies and analyses sources including existing data sets, grey literature, social media listening, and extensive surveying of WHS inspectors, experts, and Australian workers. This is a first at this frequency and scale in Australia, and we expect that it will inform national WHS projects and policies.

This project is being supported by six state WHS regulators and industry partners including ACCI, Master Builders Association, Woolworths and Inghams Group.

Since project commencement:

Over 800 responses to the public survey

Over 1700 page views on the website

For the supporting research:

https://www.centreforwhs.nsw.gov.au/about-us/national-whs-radar

23rd World Congress on Safety and Health at Work

In November 2023, Australia will host the 23rd World Congress at Sydney's International Convention Centre. Held every three years, the World Congress is the largest event for the international work health and safety community and typically attracts between 3000-4000 delegates from around 120 countries.

Australia's event is being co-organised by SafeWork NSW, the International Labour Organization and the International Social Security Association.

The World Congress provides a high-level and unique platform to exchange global information and views among work health and safety experts, representatives from enterprises and workers, social partners, decision-makers and influencers in governments and public authorities.

The event theme is 'Shaping Change – collaborating for a healthier and safer world of work'. The programme aims to share different perspectives, highlight stories of success and human experiences, as well as deliver practical examples and learnings. It offers four days of keynotes, symposia, technical sessions and tours, workshops, and networking opportunities.

Since project commencement:

More than 15,000 newsletter and social media followers

Almost 800 abstracts submissions

500 fellowship applications received.

More information about the World Congress: https://safety2023sydney.com/